

Claims:

1. A method for producing cells for transplantation into myocardial tissue of a mammal comprising the steps:

(a) providing bone marrow stem cells that have not been immortalized;

5 (b) culturing said bone marrow stem cells in a culture medium containing IGF-1 (Insulin-like Growth Factor-1) under conditions that induce said cells to differentiate into cardiomyogenic cells;

(c) monitoring the differentiation state of the cells of step (b); and

(d) collecting the cells of step (b) when at least about 50% of said cells are

10 cardiomyogenic cells.

2. The method of claim 1, wherein said bone marrow stem cells are derived from the mammal to be treated.

15 3. The method of claim 1, wherein said mammal is a human.

4. The method of claim 1, wherein said step (d) is performed when at least 50% and as many as 80% of said cells of step (b) are cardiomyogenic cells.

20 5. The method of claim 1, wherein the concentration of IGF-1 ranges from 0.1 to 25 ng/ml.

25 6. Cells for transplantation into myocardial tissue of a mammal, which are produced by culturing bone marrow stem cells that have not been immortalized in a culture medium containing IGF-1 (Insulin-like Growth Factor-1) under conditions that induce said cells to differentiate into cardiomyogenic cells and collecting the cells.

7. The cells of claim 6, wherein said bone marrow stem cells are derived from the mammal to be treated.

30 8. The cells of claim 6, wherein said mammal is a human.

9. The cells of claim 6, wherein the concentration of IGF-1 ranges from 0.1 to 25 ng/ml.

10. A pharmaceutical composition for transplantation into myocardial tissue of a mammal diagnosed as having a disorder characterized by insufficient cardiac function to treat the mammal, which comprises:

5 (a) cardiomyocytes or cardiomyocyte progenitors produced according to claim 1;

(b) endothelial cells or endothelial cell progenitors; and

(c) vascular smooth muscle cells or vascular smooth muscle cell progenitors.

10 11. The composition of claim 10, wherein the ratio of cardiomyocyte progenitors:endothelial cell progenitors:vascular smooth muscle cell progenitors is 10:1:1.

12. The composition of claim 10, wherein said mammal is a human.